

# I

## THE ANTENATAL TREATMENT OF SYPHILIS\*

By DAVID NABARRO, M.D., F.R.C.P., Medical Officer in Charge of  
the Venereal Diseases Department, the Hospital for Sick Children,  
Great Ormond Street, London.

### INTRODUCTION

IN these days when the doctrine of the prevention of disease looms so large on the horizon of medicine and the public health, it seems a self-evident proposition that one should endeavour to prevent inherited syphilis by treating the mother during pregnancy. Nevertheless it is only quite recently that this aspect of inherited syphilis has been revived, for it is only twenty years since the comprehensive "System of Syphilis," edited by D'Arcy Power and Keogh Murphy, was published, and in the excellent article on Congenital Syphilis which Dr. G. F. Still contributed to that System no mention whatever is made of the treatment of the mother during pregnancy with a view to the prevention of the disease. More recent publications, however, such as the "Diseases of Children," edited by Garrod, Batten and Thursfield (1913), Abt's "Pediatrics," and "Diseases of Infancy and Childhood," by Holt and Howland, to mention just a few, refer to the treatment of the pregnant mother even though she show no signs of infection.

### GROUPS OF CASES

When considering the antenatal treatment of syphilis in all its aspects there are three groups of cases to be borne in mind.

The first is that of a syphilis-infected individual who wishes to marry. It is generally held that no infected person should be allowed to marry until at least two years after the primary sore, adequate treatment having been

\* Based upon an address delivered before the Medical Society for the Study of Venereal Diseases on January 27th, 1928.

## BRITISH JOURNAL OF VENEREAL DISEASES

received in the meantime. Many factors, such as persistence of the Wassermann reaction, involvement of the central nervous system and so forth, have to be considered, however, before a final decision as to date can be given. The question "When may a syphilis-infected individual marry?" has been discussed at length by this Society on a former occasion.

The second class of case includes those in which syphilis is contracted after marriage or symptoms of the disease show then in either partner. In such an event both partners should be energetically treated for their own health's sake, as well as for the well-being of any future offspring. Probably they would be well advised to avoid having a child for six or twelve months, but should the wife become pregnant, treatment should be instituted immediately, if it is not already in progress.

The third class of case is that in which the wife has exhibited few or no signs of syphilis, but has had one or more miscarriages or syphilitic infants. Such a mother should undoubtedly be treated as soon as possible during a pregnancy, and it appears to be desirable to repeat the treatment during each succeeding pregnancy. This is an insurance for the child and also desirable for the mother's future health, but while it may be a counsel of perfection to advise anti-syphilitic treatment in *every* subsequent pregnancy, this, in the words of Diday, "will doubtless appear to many to be too strict a rule, or an excess of pusillanimity. I do not apply it to all patients or all cases."

### HISTORICAL

Before referring to the observations of modern syphilologists who have had the advantages over their forbears of bringing to their aid the demonstration of the *Treponema pallidum* in the tissues of infected patients, and the Wassermann, Sachs-Georgi, Kahn and similar reactions in the blood and spinal fluid, it will be interesting to ascertain how the older clinicians acted in these cases.

As far back as the seventeenth century mothers were treated during their pregnancy with anti-syphilitic remedies. In his recently published "History of British Midwifery," Dr. Herbert Spencer in an account of the life of William Smellie (1697-1763) states that Smellie quotes Mauriceau's cases in which anti-syphilitic treatment was

## ANTENATAL TREATMENT OF SYPHILIS

carried out during pregnancy with the result of the birth of a healthy child. In his book entitled "*Traité de la Maladie Vénérienne*" (1810), M. Bertin gives a clear account of his treatment of pregnant mothers with mercury and of the beneficial results upon the health of the children born. He states in that volume that some of his colleagues were afraid to treat pregnant mothers and preferred to wait until the birth of the child and then to treat both mother and child. Apparently at that period some practitioners were afraid to give mercury during pregnancy lest abortion should follow. It is interesting to learn from this work of Bertin that even as long ago as the end of the eighteenth century there existed in Paris a special hospital, L'Hôpital des Vénéériens, where pregnant syphilitic mothers, their newly born infants and wet nurses were tended and treated for their venereal disease. It is also of interest to read that whereas previously all or nearly all syphilitic infants who were treated in the general hospital of Paris died very shortly after birth, during the ten years 1800-1809, of the 1,024 infants treated by Bertin 617 died and 407 left the hospital alive.

Coming to more modern times we find that Colles, Fournier, Jonathan Hutchinson and others recommend the treatment of a mother during pregnancy, if she has had a history of active syphilis or of having had syphilitic children. But even a man of Hutchinson's great experience does not seem to have laid much stress upon this line of treatment, because in the last edition of his work on "Syphilis," which appeared in 1909, he is no more enthusiastic about it than he is in the first edition of 1887. In the text he refers to only three cases in detail in which mercury was given during pregnancy, with only one successful result.

Diday, in his work which was published in 1856, lays stress upon the importance of treatment in these cases and cites an interesting family record obtained from an Austrian source in which a mother lost her first seven children through syphilis. She was treated for the eighth and ninth, both of which were born healthy; had no treatment while carrying the tenth, with the result that that child was born syphilitic, and was treated again for the last child, which was born healthy.

That the antenatal treatment of syphilis must have

## BRITISH JOURNAL OF VENEREAL DISEASES

been a rare procedure in America in the 1870's is shown by the fact that C. C. Lee wrote an account of a case in the *American Journal of Syphilis and Dermatology*, 1871, of a mother who after two miscarriages had a syphilitic child which died in twenty-four hours, and was treated during the fourth pregnancy with mercury (biniodide and bichloride) and potassium iodide. The child was born healthy and at six weeks showed no signs of syphilis.

G. K. Johnson also writes on the "Preventive Treatment of Congenital Syphilis" in the *Detroit Medical Journal* of 1877. Fournier, in a clinical lecture which he gave in November, 1898, on the preventive treatment of congenital syphilis, recommends treatment with mercury and iodide pills. He states that this should be started as early in pregnancy as possible, and that he agrees with Pinard, who says, "intervention dating from the early months has the greater chance of success the earlier it is begun. After the fifth month it is too late and has little chance."

During the earlier years of the present century the three great advances in the pathology and treatment of syphilis, viz., (1) the discovery of the causal organism, the *Treponema pallidum*, by Schaudinn and Hoffmann in 1905, (2) the elaboration of the complement fixation test by Wassermann, Neisser and Bruck and Bordet and Gengou in 1906, and (3) the discovery by Ehrlich and Hata in 1909 of salvarsan or "606," gave a tremendous impetus to the study of the various problems of syphilis, and among these to the antenatal treatment of the disease which alone we are considering to-night.

Ehrlich himself did not advise the use of "606" in pregnancy, he thought it might be too toxic and also might induce abortion. Sauvage, of Paris, in 1913, was the first to publish any considerable number of cases so treated—91 mothers injected with 81 children born alive and without signs of congenital disease. He also compared the results obtained by himself with salvarsan and by previous authors with mercury, and found that in addition to more healthy children being born after "606," the mortality rate was also lower in "salvarsan" than in "mercury" children.

Unselme (1913), Brisson (1913), Holth (1913) and Szil (1912) together report a total of 71 cases treated, with 55 living, healthy children born. Boas makes the

## ANTENATAL TREATMENT OF SYPHILIS

very sound objection that all these children were observed for a very short time only after birth—not more than a month or two very often—and that some of them may subsequently have shown signs of inherited syphilis—as, in effect, they did. These early observations, however, showed that “606” was well tolerated by pregnant women.

TABLE I

*Reduction of Syphilis in the New-born by Treatment of the Pregnant Woman*

From Stokes, “Modern Clinical Syphilology,” 1927

Author.	Year.	Cases.	Treatment given mother.	Per cent. syphilitic children.
Adams (quoted by Roberts)	1917 1918–22	28	None . . . . .	79
		108	Galy and mercury injections . . . . .	24
Williams . . . .	1920	157	None . . . . .	53
		103	2 to 3 injections arsphenamin . . . . .	37
		163	1 course (4 to 6 injections arsphenamin and mercury) . . . . .	7·4
Beck . . . . .	1921	11	1 to 3 injections arsphenamin . . . . .	54
		17	5 or more injections arsphenamin . . . . .	6
Boas and Gam-meltoft.	1922	158	None . . . . .	99
		111	Mercury only . . . . .	71
		79	Arsphenamin only . . . . .	24
Galliot (quoted by Findlay).		144	Neo-arsphenamin . . . . .	8
Bodin . . . . .	1923	28	Neo-arsphenamin . . . . .	7

In 1915 Erwin Meyer reported upon a series of 43 cases of pregnant women who were treated with “606” and mercury. One mother aborted at 6 months, the other 42 had living children, of which 5 died during the first few days of life, 3 of them with signs of syphilis. Of the

## BRITISH JOURNAL OF VENEREAL DISEASES

remaining 37, 5 had a positive Wassermann reaction at birth, the other 32 being clinically and serologically negative. Meyer was able to follow up some of these children—7 were still alive at the end of 2 years, 19 at 1 year, and 6 at 6 months.

In this country John Adams was instrumental in establishing the first venereal centre for pregnant women—that in Thavies Inn—and here the antenatal and post-natal treatment of syphilis was undertaken with very successful results. Between the years 1917 and 1920, 95 syphilitic mothers were treated during their pregnancy with the result that 90 living children were born to them, and to the last 37 mothers so treated 37 living children were born.

Similar happy results have been recorded by Findlay (Glasgow), Beck, Whitridge Williams, Fordyce and Rosen, Veeder and Jeans, Sylvester and others in America, Couvelaire and others in France, Browne, Rundle and others in this country, Strandberg, Åhman, Almkvist and others in Scandinavia, Germany, Holland, and, indeed, in most civilised countries.

Table I, which is taken from "Modern Clinical Syphilology," 1927, by John H. Stokes, shows the reduction of syphilis in children which various authorities have reported as the result of the treatment of expectant mothers.

Whitridge Williams, in 1920, published an extensive series of cases of children born to syphilitic mothers, some treated, others untreated. Of the 449 mothers who were Wassermann positive :—

169 who had no treatment had 48·5 per cent. syphilitic children.

102 who had inefficient treatment had 39·2 per cent. syphilitic children.

178 who had efficient treatment had 6·7 per cent. syphilitic children.

By efficient treatment he means "a course of 5 or 6 injections of salvarsan, followed by mercurial treatment, which resulted in the permanent disappearance of the positive W.R."

By inefficient treatment he means "one or more injections of salvarsan, but for one reason or another, the course of treatment had not been concluded."

## ANTENATAL TREATMENT OF SYPHILIS

When one analyses his results it is of interest to find that the placenta may be normal on section and microscopically and yet the child show signs of syphilis ; and conversely the placenta may be syphilitic and yet the child be living and well, or in a fatal case may show no evidence of syphilis post-mortem. In the cases in which efficient treatment was given a very large proportion, but not all, of the children were healthy.

Williams gives the cases of a further 109 mothers with negative W.R., but with some mention of syphilis in the history. About one-half (51) had treatment in a previous pregnancy, and to these 44 normal children were born, 2 syphilitic, and 5 were born dead ; the placenta in the last five cases were healthy, but 4 of the infants were not examined post-mortem, while the fifth showed no signs of syphilis. The 56 mothers who had no treatment had 52 syphilitic placenta or children, and only 4 had no signs of syphilis in child or placenta. Williams examined the placenta in every one of his 547 cases, and from his findings and calculations concludes that " the microscopic examination of the placenta tallies with the clinical and anatomical findings in the child in from 80 per cent. to 90 per cent. of the cases, which is in marked contrast to the 40 per cent. obtained from a positive maternal W.R. It indicates that the demonstration of the so-called Fränkel's disease of the placenta offers twice as great a probability of giving correct information about the child's condition as a positive W.R. in the mother."

I have left to the last and singled out for special mention the investigations of Boas and Gammeltoft in Copenhagen, because these furnish the most comprehensive and detailed account which has hitherto been put on record in Europe. We are furthermore indebted to Boas for the excellent chapter dealing with the prevention of inherited syphilis in the volume on " Congenital Syphilis " in the " Handbuch der Haut und Geschlechtskrankheiten," edited by Jadassohn. In 1922 Boas and Gammeltoft published their first series of cases, which is referred to in Table I. At the Conference on Inherited Syphilis held in Paris in October, 1925, they prepared another table, giving the results in 545 children born to syphilitic mothers.

Boas draws attention to the fact that all " healthy " infants were under observation for at least six months, and some of the children for as long as fifteen years. Two

## BRITISH JOURNAL OF VENEREAL DISEASES

points strike one as being noteworthy in the figures given by Boas and Gammeltoft; the first is the very large number of syphilitic children born to untreated mothers, namely, 194 out of a total of 201, or 96.5 per cent. In my own clinic I am convinced that a larger percentage of healthy children have been born to untreated mothers than Boas found in Copenhagen. The second point of interest is the fact that although treated during pregnancy with mercury, so many of the mothers bore syphilitic children, as many as 72 per cent.

TABLE II

*Table Giving Boas' and Gammeltoft's Latest Figures (1927)*

Treatment of mother.	No. of cases.	Syphilitic infants.	Healthy infants.	Percentage.	
				Syphilitic.	Healthy.
Syphilis not treated . . . . .	201	194	7	96.5	3.5
Mercury before pregnancy. No treatment during pregnancy . .	87	78	9	90.0	10.0
Salvarsan before pregnancy. No treatment during pregnancy . .	15	12	3	80.0	20.0
Mercury during pregnancy . . .	111	80	31	72.0	28.0
Salvarsan before pregnancy. Mercury during pregnancy . . .	26	7	19	27.0	73.0
Salvarsan during pregnancy . . .	98	19	79	19.5	80.5
Salvarsan before and during pregnancy . . . . .	7	1	6	14.5	85.5

With regard to the percentage of syphilitic mothers among all the parturient women attended at the Riks Maternity Hospital between the years 1912 and 1921, Boas found the numbers to vary from 3.7 per cent. in 1912 to 7.7 per cent. in 1921. Whitridge Williams, in 1915, found 3.5 per cent. of 10,000 pregnant women infected, and states that he considers 5 per cent. is nearer the mark, with which statement Boas says he is in agreement. In 1920 Williams found 11.2 per cent. positive out of 4,000 examined, but for white women the percentage was only 2.48, whereas for coloured it was as high as 16.29.

J. N. Cruikshank (1922) in 1,900 unselected cases in Glasgow found approximately 10 per cent. with a positive W.R. Gladys Dodds, assistant to Professor F. J. Browne

## ANTENATAL TREATMENT OF SYPHILIS

at the Edinburgh Royal Maternity Hospital, found the frequency of syphilis about 7 per cent. in the 2,000 cases examined.

Couvelaire has published figures, from the Clinique Baudeloque in Paris, of 256 cases in which the mother was treated. When the mother was treated late in the pregnancy the foetal mortality was 30 per cent. ; when treatment was given throughout pregnancy the mortality was reduced to 15 per cent. ; and when treatment was given before and during pregnancy the mortality was as low as 3 per cent. In contrast to this there were 218 untreated cases of recent syphilis with a foetal mortality of 65 to 70 per cent. Other statistics as to the enormous number of stillbirths due to syphilis—and therefore preventable—are given by Kassowitz, 164 deaths from syphilis out of 330 pregnancies ; by Fournier, 176 deaths out of 239 ; 2,171 deaths out of 4,175, from the statistics collected by Sprinz ; 220 out of 453 pregnancies reported by Veeder. Similar figures have been published by J. W. Ballantyne for the Royal Maternity Hospital in Edinburgh in 1921. In the whole practice of the hospital there were 156 stillbirths in 2,770 births = 5.6 per cent., whereas for the Venereal Diseases Department the corresponding figures are 27 stillbirths in 171 births = 15.8 per cent. Of the mothers who received antenatal supervision and treatment, only 7 had stillbirths out of a total of 138 births = 5.1 per cent. ; whereas of mothers who had no antenatal supervision or treatment, 20 had stillbirths out of a total of 33 = 60.6 per cent. It is obvious, therefore, that the prenatal, as well as the postnatal, mortality from syphilis is very high and is largely preventable.

My own observations have not been nearly so numerous as those of many of the investigators already referred to, because the material upon which I have to work is different. There is no special clinic or department in our hospital for pregnant and lying-in mothers, and it is only during the ordinary working of the clinic when the mother is bringing up another child for treatment that one may accidentally discover that she is again pregnant, or she may volunteer the information and ask to be treated, having been previously advised that this is the wisest course to adopt to ensure the birth of a healthy child. The figures I am able to bring forward are given in Table III.

# BRITISH JOURNAL OF VENEREAL DISEASES

TABLE III  
*Results of Treatment of Mothers*  
Nabarro (1928)

	No. of cases.	Healthy children.	Syphilitic children.	M.C. or S.B. or died after birth.
1. Mothers well treated with "914" and mercury during this pregnancy .	12	12	0	0
2. Mothers imperfectly treated during this pregnancy with "914" and mercury . . . . .	5	5	0	0
3. Mercury only during this pregnancy.	1	1	0	0
4. Mothers well treated with "914" and mercury before and during this pregnancy . . . . .	5	5	0	0
5. Mothers well treated with "914" and mercury before this pregnancy and no treatment during this pregnancy .	5	4	1	0
6. Mothers imperfectly treated in a previous pregnancy and with mercury in this pregnancy . . . . .	1	1	0	0
7. Mothers imperfectly treated in a previous pregnancy and not at all in this pregnancy . . . . .	7	4	2	1
Totals . . . . .	36	32	3	1
8. Mothers treated elsewhere during this pregnancy . . . . .	21	13	8	0
9. Mothers treated elsewhere during a former pregnancy and not at all in this pregnancy . . . . .	19	12	4	3
Totals . . . . .	76	57	15	4

## METHODS

With regard to the methods adopted, the older clinicians who practised the preventive treatment of inherited syphilis had the choice of one or other of two drugs,

## ANTENATAL TREATMENT OF SYPHILIS

namely, mercury and iodide of potassium. The majority of them used mercury either in the form of biniodide, bichloride, calomel or mercurial ointment. Some of them used the drug in small doses, others endeavoured to produce salivation in their patients. Yet other practitioners were afraid to use it for fear of producing abortion, and thought it was best to wait until after the pregnancy had terminated and to treat the child after it was born. According to modern ideas salvarsan, or one or other of its substitutes, is the drug to be chosen for the purpose, and although the researches of Boas and Gammeltoft seemed to show that the best result as regards the child was obtained with silver salvarsan, nevertheless, owing to the ease of administration, neo-salvarsan, or "914," is the drug most commonly used, at any rate in this country. The majority of patients whom I have treated have been given neo-salvarsan in the form of N.A.B., but one or two cases have been given the "stabilarsan" preparation of Boots.

As regards the mercury there are different methods adopted by different practitioners. Injections of insoluble mercury salts or mercurial inunctions are recommended by Boas. My own view is that if we can obtain as good results by the oral administration of mercury as by injections, we are more likely to obtain the patients' willing co-operation by giving pills than by injection, which necessitates so many more prickings and may also lead to local inconvenience at the site of injection. Boas and Gammeltoft administer the mercury at the same time as the "606," and this first combined treatment takes about two months. They then give the patient a month's rest, and thereafter a fresh course of mercury, consisting of either six injections of mercury salicylate or 30 inunctions, is given. The patient now has another month's rest, and this brings her to about the middle of the pregnancy. Boas adds here that according to the researches of Thomsen the middle of pregnancy is the time when the treponemata begin to wander through the placenta and to infect the foetus, and consequently it is at this time that one should treat the patient energetically. The original course of eight or ten injections with "606" and ten with insoluble mercury salts is repeated, followed by another month's rest; again a month's mercury and again a month's rest, and by this time the patient is about

## BRITISH JOURNAL OF VENEREAL DISEASES

at the end of the pregnancy. Browne, Almkvist and others give arsenic and mercury or bismuth alternately, and continue the treatment throughout the pregnancy.

My own practice is simpler than that of Boas and Gammeltoft, and I have contented myself by treating the expectant syphilitic mother on similar lines to an ordinary case by giving weekly injections of N.A.B. and pills of protoiodide of mercury, gr.  $\frac{1}{4}$  t.d.s. for six weeks. The usual precautions should be taken: (1) to examine the urine before the treatment is begun and at regular intervals of, say, a month during the treatment; (2) to look to the condition of the teeth as regards pyorrhœa, tartar and sepsis; and if these are present to have them attended to; and (3) to start with a rather smaller dose than usual: my commencing dose is usually 0.3 gm. N.A.B., and I work up to 0.6 gm. for a maximum. After a month's rest from all treatment, the Wassermann is tested and the course is repeated as often as possible during the whole period of gestation. Rarely I have had a patient who could not tolerate more than 0.3 gm. N.A.B., and one patient who complained of nausea and tingling in the arms and hands after one injection of 0.3 gm. refused further injections and continued with the protoiodide pills alone. As a rule pregnant women tolerate both the arsenic injections and the mercury well, but the mother of one of my patients who was being treated by injections at another hospital is reported to have died of acute yellow atrophy of the liver in the fifth month of her pregnancy. Her death may have been due, of course, to a toxæmia of pregnancy and not to the arsenic injections.

As is now well established, the treatment results in the birth of a healthy child in a very large percentage of the cases. Some authorities nevertheless treat the children with mercury in order to make assurance doubly sure. I am of the opinion that this is unscientific, for if this were invariably done we should never ascertain if the antenatal treatment of the mother were really effective. I am personally content to examine the child every three months during the first year of its life, twice during the second year and perhaps the third year, and thereafter once annually, taking a blood test on each occasion. Some of my children I have thus watched for five years, and hitherto not one has shown signs of syphilis or developed a positive Wassermann Reaction.

## ANTENATAL TREATMENT OF SYPHILIS

The next important point is this—should a woman be treated in each succeeding pregnancy with salvarsan and mercury or bismuth? It is a well-established observation that, even without treatment, the intensity or virulence of the syphilitic infection appears to diminish with repeated pregnancies, so that a woman's later children are born healthy. Most of us must have many such families on our records. It must be remembered, however, that a woman may give birth to a syphilitic child as long as twenty years after an infection (Boas and Gammeltoft), twenty-four and twenty-six years (Marcus), and in one case reported by Boeck thirty-seven years after an infection contracted in childhood. Boas and Gammeltoft give a table showing the duration of the possibility of an infected child being born to an untreated syphilitic mother. The mothers had in all 483 pregnancies—55 of them between 4 and 20 years after infection, with 48 syphilitic and 7 healthy children; the mothers had received treatment with mercury or "606" for varying periods during the first one to three years after the infection.

I have not hitherto had the opportunity of going through all my records to see how my own figures work out amongst *untreated* mothers, but my impression is that a higher percentage of healthy children have been born to them than Boas and Gammeltoft's figures give. Can it be that by treating the mothers during pregnancy we thereby prevent the natural process, whatever this may be, which appears to go on during an untreated pregnancy and which eventually leads to the birth of healthy children?

The consensus of opinion appears to be, however, that we should treat the mother during each succeeding pregnancy; Boas is very emphatic on this point, and he adds, "even when she has a negative W.R., though the thoroughness of the treatment will depend to some extent upon the treatment the patient has had previously."

All authorities are agreed that the treatment should be begun as early as possible in the pregnancy, but several of them have drawn attention to the fact that very little treatment in the mother seems to suffice in certain cases to lead to the birth of a healthy child. I have seen several such cases, and one in particular struck me as being very instructive. A mother brought her five-year-old child to the clinic on account of interstitial keratitis, and it was

## BRITISH JOURNAL OF VENEREAL DISEASES

obvious that the mother was far advanced in pregnancy. As a matter of fact she was only about two weeks from term ; nevertheless she was given two injections of 0.3 grm. neo-kharsivan at an interval of five days. The baby, born six days after the second injection, was quite healthy and has remained so for three years with negative W.R., but it is quite likely that the child would have been healthy even if the mother had not received any treatment.

### RESULTS

The results of antenatal treatment I have already indicated, and it must be remembered in this connection that we cannot absolutely promise the mother that she will have a healthy child. Nevertheless, should the child unfortunately be born syphilitic, it will not be very badly affected and will promptly respond to treatment.

When assessing the value of antenatal treatment, it should be borne in mind, however, that latent syphilitic mothers, that is to say, mothers whose only symptom is a positive Wassermann reaction, may bear healthy children, and the fact that one or two injections have been given during pregnancy should not be regarded as evidence that this small amount of treatment has produced the beneficial result which has been ascribed to it.

### PRACTICABILITY

It is somewhat difficult to suggest how this preventive treatment should be carried out on a large scale. Professor Browne and others strongly recommend the compulsory notification of pregnancy. It appears to me that this is rather a delicate matter and a suggestion which is likely to meet with a considerable amount of opposition. In the event of a prospective mother failing to comply with the law, how and when is she to be punished ? Is the prosecution to wait until the termination of the pregnancy and of the lying-in period, or to proceed during the pregnancy ? Or perhaps the husband will also be prosecuted as an accessory after the fact, should he, too, fail to notify his wife's condition ? I do not think that the compulsory notification of pregnancy is likely to commend itself to a considerable proportion of the public, and I would venture to suggest as an alternative that cases of inherited syphilis should be compulsorily notifiable, and that such

## ANTENATAL TREATMENT OF SYPHILIS

cases be followed up by tactful health visitors or inspectors. A twofold purpose could be served by this procedure : the visitor could look after the child's interest and see that it was brought regularly to the family doctor or clinic for treatment, and secondly, by keeping in touch with the family and gaining the mother's confidence, she could from time to time remind her that should she become pregnant again she should go to her doctor and be treated. My own practice for several years past has been to tell every mother who comes to the clinic with an infected child, that it is possible by means of treatment during pregnancy to promise that a healthy child can almost certainly be born to her, and I advise her to inform the Medical Officer of the Clinic as soon as she has occasion to believe that she is again pregnant. It is advisable, too, to point out to such a mother how much inconvenience she herself will be spared by not having to bring up a child constantly for treatment, as she would almost certainly have to do if she did not have treatment during the pregnancy, apart altogether from the fact that a healthy child is very likely to be born to her should she herself submit to treatment. The establishment of V.D. treatment centres for pregnant women in adequate numbers in all large cities on the lines of the Thavies Inn Centre, which was started by Mr. John Adams, is certainly desirable. The co-operation of maternity and child welfare centres may also be enlisted in this connection.

Lastly, the question may be asked : " Is it worth while ? " There can be no question as to the enormous wastage of life occasioned by syphilis. J. E. Moore, in 1923, published some statistics in the *Johns Hopkins Hospital Bulletin* giving the results of pregnancies occurring before admission or treatment in 100 syphilitic women. Out of a total of 319 pregnancies there were 131 miscarriages and stillbirths (41 per cent.), 29 children died in infancy of syphilis, and 35 living children were syphilitic, giving a total of 20 per cent. ; and 29 children died in infancy of an unknown cause. The statistics of Whitridge Williams already referred to, and the numerous other records in the literature going back for 200 or more years, all bear witness to the same heavy mortality. Much of this wasted life is unborn or dies soon after birth, and, if I may be permitted to say so, need not trouble us unduly. If every product of conception of a syphilitic

## BRITISH JOURNAL OF VENEREAL DISEASES

mother were to reach maturity, the world would much sooner become over-populated and unable to support its inhabitants than would otherwise be the case. Just as Nature provides us with disasters in the form of earthquakes, wars and epidemics of disease, so one ought to regard the prenatal mortality from syphilis as one of her provisions against a too-rapid filling of the world with people.

From this point of view alone I would not strongly advocate the antenatal treatment of syphilis, but from the point of view of preventing the unnecessary suffering of congenitally-syphilitic children, the unhappiness it causes to the parents of such children, and the burden these children may become to the State owing to defects such as partial or complete blindness, deafness, mental deficiency and so forth, I most emphatically recommend the treatment of the pregnant syphilitic mother, for the sake of her child and of her own future health.

In conclusion, I should like to express my gratitude to Colonel L. W. Harrison for lending me many of his reprints of the papers which have been referred to in the text, to my colleagues at the Hospital for Sick Children for their permission to treat the cases and to utilise the notes, to Dr. B. Buckley Sharp for his valuable assistance in the work of the Clinic, to Dr. D. McClean for help with the pathological investigations, and to all my lay assistants whose help has at all times been most willingly given.